

## Description

# [Coralline And Tough Algae Remover For Fish, Corals And Invertebrates Aquariums]

### BACKGROUND OF INVENTION

[0001] My invention applies to fish, corals and invertebrates keeping hobbies. It can be utilized into making a device to remove annoying coralline and other tough algae from the inner surfaces of an aquarium.

[0002] To maintain a successful reef aquarium where reef building stony hard corals such as acropora corals are kept, the most important element in the water is calcium. Hobbyists use various methods to maintain calcium concentration in their tanks to be similar to that in the ocean to about 420ppm (parts per million). In nature, there exists a desirable pink/purple alga called coralline alga that also utilizes calcium for its growth. Hobbyists are delighted to see coralline alga grow on rocks and back wall of their aquariums. But inevitably, some of the alga would grow

onto the front and side surfaces of their tanks blocking the views into their beautiful aquariums! Since this kind of algae is mainly composed of calcium, it is hard and bound firmly against the inner surface of a tank. The widely used methods for removing them are to scrap them off by hand while holding a rod with a hard plastic/steel blade at its one end or scrap it off while holding an expired plastic credit card or using similar handheld scrapping gadgets. Unfortunately, not only are these scrappers uncomfortable to hold for more than a couple of minutes and hard to apply pressure, they are also difficult to use for deep tanks and hard to reach spots. During the scrapping chore, the hobbyist's hand and arm are in the water all the time causing discomfort and it is also likely to scratch the inner surfaces of the tanks, especially, if the tanks are made out of acrylic material.

#### **SUMMARY OF INVENTION**

[0003] My invention allows hobbyists to remove coralline and other tough algae without getting their hands and arms wet! It consists of four components: Component 1 has a specially made rectangular heating element connected to a power cable and housed into a case together with a couple of strong magnets. A hole is cut onto the case to

expose the surface of the heating element to the outside. The whole assembly is then made waterproofed. The case, hanging by the power cable, is submersed into a fish tank and stuck onto the inner surface by magnetic attraction principle.

[0004] Component 2 is a couple strong magnets in a protective case. When pressed against the outside of the tank, it attracts component 1 to it. The result is that the heating element which measures at least 2.0cm x 2.0cm surface area is pressed against the inner surface of the glass with just a thin layer of water about 1mm thick between its surface and the glass.

[0005] Component 3, which is a low voltage output switching power supply, delivers electric current to the heating element through the power cable that runs into the heating element. The outer surface of the heating element becomes very hot and heats up the thin layer of water quickly. Water there shoots up to the boiling point within a few seconds. Any coralline and other tough algae on the inner surface and within the surface area of the heating element will be killed instantly. For coralline alga, it turns from pink/purple based color into greenish white color. Once the alga is dead, it loses most of its gripping ability

and can be scrapped off easily by using the fourth component of my device.

[0006] The fourth component is the magnetic coupled scrapper. It is a rectangular box with elevated edges on the bottom side to help dislodge loosen dead algae. The box also contains a couple of very strong magnets made out of rare earth material like neodymium. When the scrapper box is dropped into the inside surface of the tank, it is attracted by the strong magnets outside the tank such that elevated edges are pressed firmly against the inner surface of the tank. Maneuvering the submersed scrapper to the dead coralline or tough algae spot and by moving the outside magnets back and forth, the dead algae will be dislodged from the glass and fallen into the bottom of the tank.

#### **BRIEF DESCRIPTION OF DRAWINGS**

[0007] Component 1: Algae killer Block diagram – It contains a waterproof case, a couple of strong magnets and a power cable connected to a thin heating element.

[0008] Component 2: Outside–The–Tank magnet Block diagram It contains a case into which a couple of strong magnets are stored.

[0009] Component 3: Low power Output Switching Power Supply Block Diagram It contains a power supply and an on/off

switch.

- [0010] Component 4: Dead Algae Scrapper Block diagram – It contains a waterproof case with elevated scrapping edges and a couple of strong magnets.

#### **DETAILED DESCRIPTION**

- [0011] The design of the algae killer is as thin as possible so that it can be moved around easily to every part of the inner surface of the tank. The heating element design is thin too so that the heat transfer to the surface can be very quick and efficient. The heating element is sealed in a rectangular opening in the case. The thickness of the case's material defines the volume of water that will be heated up by the heating element. Two strong magnets are also housed in the box and are located beside the heating element. One magnet has its north pole facing outward to the top of the case while the other is facing inward. This arrangement allows easy maneuvering of the case when it is attracted by another two magnets with opposite poles situated outside the tank. The hobbyist will then maneuver and position the heating element right over the alga ready to be killed. A properly gauged power cable has its one end connected to the heating element and the other end to a power supply. The voltage used for

heating up the heating element is low voltage (less than 15VDC) and does not present danger to the hobbyist and living inhabitants in the tank. The power delivered to the heating element is designed such that it will heat up the thin layer of water to the boiling point within 10 seconds. To counter the fact that water expands when heated up, a small channel is gulfed onto the surface of the case at one edge of the cutout where the heating element is situated. This allows water to enter into the heated area. Without the channel, the water within the surface area of the heating element will be depleted as the water heats up in there and escapes through the surface between the case and the glass.

[0012] The hobbyist can easily determine that coralline alga is killed by observing the color of the alga. Once it turns from pink/purple to greenish white, the mission is completed and the case can be moved to other affected spots.

[0013] To remove the dead alga, my second invention is picking up the task. The submersible Algae scrapper consists of a rectangular case into which two strong magnets are housed. Several rows of elevated edges are made on one side of the case. When the case is pressed flat against a surface, the elevated edges also press flat and tight

against the surface. The edges are made from hard plastic.

[0014] The scrapper when placed against the inner surface of a tank can be maneuvered by using strong magnets outside of the tank. By moving the outside strong magnets back and forth over the dead alga, the alga can be scrapped off from the surface of the tank. The scrapper is effective to scrap off larger packs of dead algae as well as smaller live coralline algae. With my invention, the hobbyist can stay on top of the algae spreading with practical effort and can enjoy his or her beloved animals more.